INTERSTATE ANTELOPE CONFERENCE

1975 Transactions

INTERSTATE ANTELOPE CONFERENCE

1975 TRANSACTIONS

Papers presented at the annual meeting held in Alturas, California on March 9, 1975 are included in these transactions.

compiled by

OREGON DEPARTMENT OF FISH AND WILDLIFE

These transactions are available from the Chairman. Conference members, antelope project workers, and educational institutions may obtain copies subject to a very limited supply.

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Chairman:

Frank Grogan
Oregon Department of Fish and Wildlife

Cover Photograph

Harold Smith

CONFERENCE GUIDELINES

1. The annual meeting will be held on the first Tuesday in March, at Alturas, California. The 1976 meeting will be held on March 8, 1977.

2. The Chairmanship of the conference will rotate between the four representing agencies. The U. S. Fish and Wildlife Service will provide the 1976 Chairman, with California, Nevada and Oregon following in that order. The 1976 Chairman will be responsible for conducting the March 1976 Meeting.

3. Each contributing agency shall provide 100 unstapled copies of their formal presentation. These shall be on standard 8½ x 11 paper with pages unnumbered, printed single space on one side only, and with a margin of 1½ inches for binding. The first page of the report shall carry the title, author's name, author's title, and organization.

4. The Chairman is responsible for compilation of the Conference Transactions covering that period for which he serves.

5. Transactions will be distributed in accordance with standing requests of participating agencies. Additional requests from other agencies, departments, and bureaus shall be honored at the discretion of the Chairman subject to availability. Added requests received by Conference members should be forwarded to the Chairman with a "Send" or "No Send" recommendation. Distribution of the 1975 Transactions was as follows:

AGENCY	NO. COPIES
California Department of Fish and Game 1416 Ninth Street Sacramento, California 95814	15
Nevada Department of Fish and Game P.O. Box 10678 Reno, Nevada 89510	15
Oregon Department of Fish and Wildlife P.O. Box 3503 Portland, Oregon 97208	15
Bureau of Land Management Federal Office Building 2800 Cottage Way, Room E-2820 Sacramento, California 95825	4

AGENCY	NO. COPIES
Bureau of Land Management 300 Booth Street Reno, Nevada 89502	6
Bureau of Land Management P.O. Box 2965 Portland, Oregon 97208	5
Modoc National Forest Alturas, California	6
Fremont National Forest P.O. Box 551 Lakeview, Oregon 97630	2
U. S. Fish and Wildlife Service P.O. Box 111 Lakeview, Oregon 97630	10
National Park Service Klamath Falls Group P.O. Box 128 Klamath Falls, Oregon 97601	2

6. The current Chairman shall notify the following as to the time and place of the Conference. These individuals will have the responsibility for notifying those interested parties in his particular jurisdiction as to the time and place of the meeting.

NAME	AGENCY	ADDRESS
Director	Nevada Department of Fish and Game	P.O. Box 10678 Reno, NV 89510
Paul Ebert	Oregon Department of Fish and Wildlife	P.O. Box 3503 Portland, OR 97208
Dave Luman	Bureau of Land Management	P.O. Box 2965 Portland, OR 97208
Vic Masson	Oregon Department of Fish and Wildlife	P.O. Box 8 Hines, OR 97738
Stan Thompson	California Department of Fish and Game	P.O. Box 1480 Redding, CA 96001
Refuge Manager	Sheldon-Hart Mountain Refuges	P.O. Box 111 Lakeview, OR 97630
Refuge Manager	Klamath Basin National Wildlife Refuges	Route 1, Box 74 Tulelake, CA 96134

NAME	AGENCY	ADDRESS
Superintendent	Lava Beds National Monument	P.O. Box 867 Tulelake, CA 96134
Forest Supervisor	Fremont National Forest	P.O. Box 551 Lakeview, OR 97630
W. M. Shaw	Idaho Department of Fish and Game	P.O. Box 25 Boise, ID 83707
Bill Radtky	Bureau of Land Management	Federal Office Building 2800 Cottage Way Room E-2820 Sacramento, CA 95825
Forest Supervisor	Modoc National Forest	Alturas, CA 961
Jim Yoakum	Bureau of Land Management	300 Booth Street Reno, NV 89502
Superintendent	National Park Service Klamath Falls Group	P.O. Box 128 Klamath Falls, OR 97601

ATTENDANCE ROSTER

NAME	AGENCY	ADDRESS
Blaisdell, Jim	National Park Service	Klamath Falls, OR
Bloom, Clark	U. S. Fish and Wildlife Service	Alturas, CA
Cater, Pete	U. S. Fish and Wildlife Service	Lakeview, OR
Fields, Bob	U. S. Fish and Wildlife Service	Tulelake, CA
Fisher, E. Leon	U. S. Forest Service	Alturas, CA
Gladwin, Terry	U. S. Fish and Wildlife Service	Lakeview, OR
Grogan, Frank	Oregon Department of Fish and Wildlife	Lakeview, OR
Haertel, Paul	National Parks Service	Lava Beds N. M., CA
Hess, Mike	Nevada Fish and Game	Reno, NV
McLaury, Eldon	U. S. Fish and Wildlife Service	Lakeview, OR
Page, Jerry L.	Bureau of Land Management	Cedarville, CA
Swickard, Deane	Bureau of Land Management	Susanville, CA
Thayer, Douglas J.	California Fish and Game	Alturas, CA
Thompson, Stan	California Fish and Game	Redding, CA
Yoakum, Jim	Bureau of Land Management	Reno, NV

STATE OF CALIFORNIA
THE RESOURCES AGENCY

Department of Fish and Game

I. Herd Surveys

A. Annual Census

The annual aerial census of antelope wintering in northeastern California was conducted January 19, 20, 21, 22 and 23, 1976. Counting conditions ranged from poor to excellent. Due to mild weather conditions winter ranges were, for the most part, snow free. Antelope were well dispersed on winter ranges and along migration routes. Antelope were also found on areas of summer range and in locations not considered normal winter range.

The census revealed four thousand eight hundred sixty-nine (4869) in the basic California antelope population. The 1976 count was up 760 animals or 19 percent over the 1975 census. This was the highest count since the present system was adopted in 1953. The five-year average count for the census is 4,155 antelope. The 1976 census represents an increase of 3,089 antelope, or 173 percent over the low population year of 1960 which showed a total of 1780 animals.

In addition to the basic California population one hundred eighteen (118) antelope were counted on interstate ranges in Surprise Valley. As these animals are part of an erratic winter population, which often winter in Nevada, they are not included in the basic California population. This was the first time in six years that antelope were found on the interstate ranges in California.

B. Buck Doe Ratio

Aerial herd composition counts were conducted July 21, 22, 23, 24 25 and 28, 1975. The time allocated for conducting the herd composition has been extended due to the increase in the numbers of antelope being classified. All known antelope summering areas were checked. During the two previous years we did not check all summering areas due to a shortage of scheduled flight time.

Prepared by: Douglas J. Thayer
Assistant Wildlife Manager-Biologist

Two thousand eight hundred forty-four (2,844) antelope were classified. The buck ratio was 28 bucks per 100 does. The 1975 ratio was up 2 bucks per 100 does over the 1974 ratio, but was 6 bucks per 100 does below the previous five-year average.

C. Production

Kid ratios are obtained during the summer aerial herd composition counts. The 1975 kid to doe ratio was 51 kids per 100 does. This count was up 10 kids per 100 does over the 1974 ratio and 3 kids per 100 does over the previous five-year average.

D. Harvest

For the twelfth consecutive year a special season for antelope was held in northeastern California. Season dates were Ausust 23 through September 1, 1975. Two hundred twenty-five (225) permits were issued on a statewide drawing basis and cost $15. Adult bucks only were legal. Hunting regulations were basically the same as in 1974.

Hunters reported killing 170 male antelope for a success ratio of 76 percent. During past years hunter success has varied from 59 to 80 percent with an average of 73 percent.

The number of yearlings in the kill increased from 16 percent in 1974 to 23 percent in 1975. During the past 10 hunts the percent of yearlings in the kill has ranged from 12 to 36 percent. The 4 and older age class animals made up 38 percent of the kill, the same as in 1974. The percent of 4 years and older animals in the yearling kill has ranged from 22 to 38 percent.

Hunting permit quotas were determined using the same system as in 1974. (See 1974 transactions)

The area was again divided into seven hunt zones. All hunters were required to report on the success of their hunt through the tag and report card system employed in previous years.

An antelope hunting orientation session was held the day before the hunt began. This was the fifth such session. Attendance at the session was good. Of the 112 people in attendance at least 69 were permit holders. The enthusiastic reaction of those people who attended the session demonstrates the value of the sessions as a public relations and educational medium.

During the past 12 years there have been 3,625 permits issued and hunters have taken 2,656 antelope. Antelope numbers are 86 percent higher in 1976 than they were in 1964 when the series of hunts began.

The California Department of Fish and Game has requested a special antelope hunt for 1976 with 375 permits to be issued. Regulations will be basically the same as in 1975.

II. Range Surveys

A. Weather Conditions

Seasonal precipitation was below normal. Light and intermittent snow fall prevailed on winter ranges until the first of February, 1975 when up to 18 inches of snow fell on winter ranges. Weather conditions throughout the spring were unsettled with above normal precipitation and below normal temperatures.

B. Range Modification

None specifically for antelope.

C. Range Evaluation

Overall range conditions for 1974-75 were fair to good.

III. Miscellaneous

A. Disease

No disease occurrence was reported in 1975.

B. Tagging

No tagging or marking operations were conducted in 1975.

The locating and mapping of kidding grounds is being continued. Procedure involves overflights over all known antelope ranges during the kidding period.

IV. Summary

The basic California antelope population in January, 1976 was 4,869 annuals. The 1976 count was up 760 animals or 19 percent from 1975 and 173 percent from 1960.

The buck ratio for 1975 was 28 bucks per 100 does which was up 2 bucks per 100 does over the 1974 ratio.

The 1975 kid ratio of 51 kids per 100 does was up 10 kids per 100 does over the 1975 ratio and 3 kids per 100 does over the five year average.

The twelfth consecutive special hunt was held in 1976. Two hundred twenty-five permits were issued. Hunters took 170 male antelope for a hunter success ratio of 76 percent.

Seasonal precipitation was below normal, however precipitation for the spring months was above normal. Annual forage conditions were fair to good.

The following tables show current data with comparative information from previous years.

TABLE I

Winter Aerial Census in Northeastern California

Year	Total Counted	*Erratic Winter Population	Basic California Population
1953	2247	122	2125
1954	2022	172	1850
1955	2137	180	1957
1956	2338	0	2338
1957	2080	107	1973
1958	2165	0	2165
1959	1917	0	1917
1960	1961	181	1780
1961	2068	162	1906
1962	2354	85	2269
1963	2498	123	2375
1964	2618	0	2618
1965	2468	0	2468
1966	2898	163	2735
1967	2665	128	2537
1968	2607	0	2607
1969	2971	101	2870
1970	2999	16	2983
1971	3800	0	3800
1972	3764	0	3764
1973	4357	0	4357
1974	4747	0	4747
1975	4109	0	4109
1976	4987	118	4869

*Erratic winter populations occupying interstate ranges east of the Warner Mountains subtracted from total, leaves the basic California population.

TABLE II

Antelope Herd Composition Summary

Year	Population	Bucks:	Does:	Kids	No. Classified
1954	1850	58	100	84	689
1955	1957	52	100	77	1020
1956	2338	51	100	57	927
1957	1973	58	100	66	861
1958	2165	59	100	70	1390
1959	1917	46	100	53	1496
1960	1780	32	100	39	1079
1961	1909	44	100	64	1042
1962	2269	39	100	42	1493
1963	2375	44	100	62	1721
1964	2618	47	100	57	1918
1965	2468	44	100	52	1592
1966	2735	35	100	40	1718
1967	2537	40	100	58	1963
1968	2607	39	100	61	2025
1969	2870	37	100	69	2336
1970	2983	35	100	63	2779
1971	3800	41	100	40	3089
1972	3764	33	100	55	3289
1973	4357	34	100	42	2769
1974	4747	26	100	41	2711
1975	4109	28	100	51	2844

TABLE III

Buck Antelope Kill by Season

Year	Permits Issued	Reported Kill	Hunter Success Ratio
1942	500	405	.81
1943	500	362	.72
1944	500	322	.64
1945	500	307	.61
1949	500	349	.70
1951	416	280	.67
1959	171	120	.70
1964	240	183	.76
1965	240	141	.59
1966	265	179	.68
1967	250	159	.64
1958	260	189	.73
1969	270	204	.76
1970	300	241	.80
1971	400	303	.76
1972	380	301	.79
1973	385	305	.79
1974	410	284	.69
1975	225	170	.76

TABLE II

Antelope Herd Composition Summary

Year	Population	Bucks: Does: Kids			No. Classified
1954	1850	28	100	84	689
1955	1957	32	100	77	1020
1956	2333	31	100	57	327
1957	1973	38	100	66	861
1958	2165	36	100	70	1390
1959	1917	46	100	55	1490
1960	1720	32	100	39	1029
1961	1909	44	100	64	1042
1962	2269	39	100	62	1483
1963	2373	41	100	62	1721
1964	2018	47	100	57	1918
1965	2468	44	100	52	1592
1966	2723	38	100	50	1718
1967	2537	40	100	58	1963
1968	2607	39	100	61	2020
1969	2713	37	100	66	2330
1970	2965	33	100	63	2729
1971	3800	41	100	40	3090
1972	2704	33	100	55	2289
1973	4341	34	100	42	2709
1974	4747	26	100	41	2711
1975	4109	28	100	51	2944

TABLE III

Rock Antelope Kill by Season

Year	Permits Issued	Reported Kill	Hunter Success Ratio
1942	500	402	.81
1943	370	302	.72
1944	500	322	.64
1945	503	307	.61
1946	500	349	.70
1951	415	280	.67
1952	171	120	.70
1954	249	193	.78
1955	250	141	.56
1956	253	139	.55
1957	250	159	.64
1958	250	189	.75
1959	270	204	.76
1970	300	241	.80
1971	400	303	.76
1972	380	301	.79
1973	365	305	.79
1974	410	264	.65
1975	225	170	.76

NORTHWESTERN NEVADA ANTELOPE STUDIES

BILL FOREE
GAME AGENT II
NEVADA DEPARTMENT OF FISH AND GAME

I. HERD SURVEYS

A. Annual Census

Aerial surveys conducted in March, 1975, resulted in a count of 1,938 antelope compared to a peak count of 2,224 antelope in 1974. This represents a 13.6% decrease. Having decreased to a low of under 1,000 animals in 1957, the antelope herd has now recovered to what it was in 1950. Most of this increase has occurred during the past 5 years in spite of mediocre production.

The decrease in 1975 from 1974 is difficult to assess by units because of migration from one unit to another, but generally counts in northern Washoe County decreased 8% while those in Humboldt County decreased 12.5%. Table I summarizes annual counts by unit.

B. Buck-Doe Ratio

A ratio of 25 bucks per 100 does was obtained during the 1975 summer production surveys. This compares to a ratio of 34 bucks per 100 does in 1974 and 38 bucks per 100 does in 1973.

During the March aerial survey in 1975, a ratio of 24 bucks per 100 does was obtained compared to a ratio of 31 bucks per 100 does in 1974 and 38 bucks per 100 does in 1973.

In both types of surveys the buck-doe ratio has shown a downward trend.

C. Production

A total of 1,735 antelope were classified in July and early August, 1975. The herd at this time was comprised of 262 bucks, 1035 does and 438 kids, yielding a ratio of 42 kids per 100 does compared to 40 kids per 100 does in 1974 and 39 kids per 100 does in 1973.

Northern Washoe County showed the best production with about 50 kids per 100 does while Humboldt County had about half this or 26 kids per 100 does. Since 1972, production has been consistently better in northern Washoe County than in Humboldt County. This has been true particularly in the Hart Camp and Smoke Creek Units. Table II summarizes data for 1975.

D. Harvest

The 1975 regular season ran for the usual 10 days beginning on

August 23 and ending on Labor Day, September 1. The Sheldon late hunt ran from August 30 through September 7. There were 1,602 applications received for 285 tags available statewide in 1975 compared to 2,846 applications received for 350 tags available statewide in 1974. Tag fees are $25.00 and a $2.00 non-refundable application fee is required.

Of the total tags available in 1975, 180 were for northern Washoe County, Humboldt County and the Sheldon Range. This is a decrease of 80 tags from 1974. From 178 returns in 1975, hunters reported a harvest of 141 antelope for an overall success of 79% compared to 76% in 1974 and 79% in 1973. Hunter success is generally higher in northern Washoe, particularly in the Smoke Creek and Hart Camp units, than in Humboldt County. A checking station was again operated at Gerlach the first weekend of the season but data is not available at this time.

An antelope archery season was held from July 26 through August 7 with 200 tags available statewide. Of these, 113 were sold and 5 antelope reported harvested. Persons taking an antelope on an archery tag must have the tag validated no later than 5 days after harvest and are not eligible to apply for another antelope tag, either general trophy or archery for 5 years. Table III summarizes data for 1975.

II. RANGE SURVEYS

A. Weather-Precipitation

Total precipitation was about 5% above normal in 1975. Winter precipitation was 13% above normal while summer precipitation was 11% below normal. A good snowpack occurred in the winter of 74-75 resulting in good spring and stream flow. Water distribution was very good. Lack of summer precipitation caused the usual drying up of forage in late summer and fall.

Precipitation received so far this winter has been much below normal. Snowpack is light.

Weather during the antelope kidding season was good with light precipitation and mild temperatures

B. Range Modifications

No sagebrush spraying was done in 1975 by land management agencies. Control burning by the U.S. Forest Service was limited to a few hundred acres in the Santa Rosa area. Both the B.L.M. and Forest Service plan control burning of big sagebrush in the future in conjunction with rest-rotation grazing systems.

Most of the response to burns has been in grasses and to a lesser degree in forbs. Giant wild rye grass especially shows up well. Most browse species crown-sprout except sage and bitterbrush. Burns at lower, drier elevations are likely to come back into rabbitbrush.

C. Range Evaluation

Rest-rotation grazing systems are being implemented as fast as money, cooperation of permittees and developing suitable plans will permit. These plans should consider forage production for all classes of animals, wild and domestic. While the B.L.M. is waiting for rest-rotation grazing systems to be implemented, they have recently announced plans to keep livestock off the range for two months during the early growing season each year.

Grasses have undoubtedly shown the best response to controlled grazing and most systems so far have been developed with this in mind. The B.L.M. estimates that less than 15% of the Winnemucca district is under rest-rotation today.

Wild horses have increased to about 7,200 head in the Winnemucca district with 1300 of these on the Owyhee Desert. Some B.L.M. people feel that horse numbers have peaked out and the population is now static, at least, in some areas.

Many ranges are still in poor condition as they have been for many years and some continue to decline. Areas that have been under control grazing systems show improvement in forage production and composition. So far this cannot be directly correlated to any increase in wildlife. Much of this may be due, as mentioned earlier, to the quick response of grasses which certainly do not favor antelope or deer. Some plans have been developed in bitterbrush areas but unless these plants are allowed to produce seeds and unless seedlings are protected after germination, little success can be expected.

Northern Washoe County ranges are generally rated in poor condition, but antelope production, though not real good, averages better than anywhere else and the antelope herds have shown a greater increase than anywhere else.

Portions of the Owyhee Desert have been under grazing management now since 1968. Summer range consists of 4 pastures, 3 of which are used on a rotation basis so that each year one is used early, one used after seed ripe and one is rested. The fourth pasture is used after seed ripe each year. There are no horses in these pastures. They range on spring pastures farther out in the desert. Grasses have responded well in this area under rest-rotation grazing and forbs to a lesser degree. Antelope have increased in the area but kid production has been rather poor.

Another unit, Summit Lake, has had no grazing control and yet this antelope herd has almost tripled in the past 10 years. Kid production has been good at times but generally poor the last 4 years.

In the Lone Willow area in the Kings River unit, antelope appeared to make less use of the area after rest-rotation grazing was implemented than they did before. This herd shows a decrease in production and total

population.

Antelope have a wider distribution on the ranges than they did 10 years ago. This could be because there are more antelope or that ranges have become more favorable or that there is better water distribution.

The Washburn seeding in northern Humboldt County was planted by fixed wing aircraft in February, 1971 to nomad rhrizomatous and Ladak rangeland alfalfa. It had been seeded to crested wheatgrass the fall before. The alfalfa has done well. It makes up about 11% of the total ground composition and 1/3 of the forage composition. It is a plant that does not produce many pounds per acre but it has a long taproot and remains green throughout the summer. The seeding is on winter range at about 5,000 feet elevation. Antelope make use of it in the winter and spring but not in the summer. There is no water in the area. It has been observed over the years that antelope do not especially like straight crested wheatgrass seedings. They use them when first developed and for short periods in the spring. Most of the seedings eventually revert back to brush and are lacking in perennial forbs.

III MISCELLANEOUS EVALUATION

A. Disease

None was reported in 1975.

B. Predation

No active predation on antelope was observed or reported in 1975. The age old controversy of whether or not predators are still a factor in antelope kid survival still rages. There is enough information to say they are a factor but not enough information to say how much of a factor. Few studies have been directed to this task.

During a three year period from 1971 through 1973, stomachs were collected from coyotes on the Owyhee Desert in May and June and analyzed. A total of 17 stomachs were checked, of which 3 were found to be empty. The remaining stomachs contained a variety of food items whole or in parts. Mice were found in 9 stomachs, rabbits in 4 and antelope kid portions in 3. Other items including gophers, squirrels, meadow larks, lizards and domestic animals appeared with less frequency.

This study was discontinued because the results were not conclusive enough to determine if there was actual predation or not. Coyote numbers are believed to be static at high levels according to the Division of Wildlife Services. Rabbit populations are still low but are increasing some. Mice populations have been down since the severe cold winter in 1972-73.

Control of coyotes is limited to complaints. Many are trapped and callers take quite a few each year.

C. Food Habits

Rumen samples collected from antelope during the 1969 hunting season are still on the shelf.

IV. SUMMARY OF DATA

A. Antelope populations decreased the past year but remain at high levels.

B. Buck-doe ratios have been decreasing for the past three years.

C. Production was about average in 1975 and has been about the same for the past three years.

D. Tag numbers have been reduced and harvest success remained relatively high.

E. There does not appear to be a great deal of measurable correlation between antelope production and populations to annual range condition.

F. Range condition remains poor with some improvement under rest-rotation grazing systems.

G. Coyote populations remain static at high levels.

V RECOMMENDATIONS

A. Continue antelope trophy hunts by unit.

B. Continue to monitor and evaluate range modifications and grazing systems to determine their effects on antelope populations.

C. Consider radio telemetry study of kid antelope to determine nature of mortality.

TABLE I
POPULATION TREND

Unit	1971	1972	1973	1974	1975
New Year Lake	6	119	0	126	60
Hart Camp	490	566	924	934	693
Smoke Creek	699	338	338	404	502
Summit Lake	146	200	234	266	200
Kings River	158	152	154	147	121
Santa Rosa	218	228	229	367	362
TOTAL:	1,717	1,603	1,879	2,244	1,938

TABLE II
HERD COMPOSITION (1975)

Unit.	No. Classified	Bucks	Does	Kids	B/100 D	K/100 D
New Year Lake	331	40	212	79	19	37
Hart Camp	512	97	271	144	36	53
Smoke Creek	483	87	258	138	34	53
Summit Lake	121	12	85	24	14	28
Kings River	76	6	57	13	11	23
Santa Rosa	212	20	152	40	13	26
TOTAL:	1,735	262	1,035	438	25	42

TABLE III
HARVEST (1975)

Unit	No. Tags	Returns	Harvest	Unsuccessful	Did not Hunt	% Success
New Year Lake	15	14	9	5	0	64
Hart Camp	45	45	39	6	0	87
Smoke Creek	45	45	38	6	1	86
Summit Lake	25	24	13	10	1	54
Kings River	10	10	6	4	0	60
Santa Rosa	20	20	17	3	0	85
Sheldon	20	20	19	1	0	95
TOTAL:	180	178	141	35	2	79

OREGON ANTELOPE REPORT - 1975

Al Polenz - Wildlife Biologist
Oregon Department of Fish and Wildlife

I. Herd Survey

A. Annual Census

All of the 1975 aerial census was completed by the middle of March. Much of the area enjoyed good counting weather, however, the census in Malheur County was delayed about 30 days because of broken snow cover and poor flying conditions. Herds were broken and scattered when the census was made. A total of 7,745 antelope was observed on 3,905 miles of census route. The 2.0 antelope observed per mile of route in 1975 was five percent below the 1974 figure of 2.1 but 11 percent above the ten year average of 1.8 antelope per mile.

B. Buck-Doe Ratios

A total of 2,224 antelope were classified prior to the August hunting season. The slightly increased buck ratio of 25 bucks per 100 does is still 14 percent below the ten year average of 29 bucks per 100 does. (Tables III and III-a).

C. Production

The 34 fawns per 100 does recorded this year was identical to the 1974 figure. This is eight percent below the 10-year average of 37 kids per 100 does. (Tables III and III-a).

D. Harvest

Report cards returned by 74 percent of the 1,520 tag holders revealed an estimated total harvest of 628 buck antelope for the five day August hunt. The 48 percent hunter success was a nine percent drop from the 53 percent success enjoyed during the 1974 season.

A total of 1,520 tags were issued for the rifle season and 118 tags were issued for the two Gerber Reservoir Archery seasons. No antelope were reported taken by the archers (Table IV).

II. Range Surveys

A. Weather Conditions - Precipitation

The 1974-75 winter was one of generally above average moisture, especially during the late winter and early spring months. Winter temperatures were near average to slightly above average.

There was ample water and forage on most high desert ranges to allow adequate antelope dispersal. The water held well into the fall months.

B. Range Modification

Sagebrush conversion projects continue but at a greatly reduced rate from past years.

Miscellaneous

A. Diseases, Parasites, Predation

No evidence of mortality from disease or parasites was found. A predator control project was initiated on a large portion of the Wagontire Unit in early May, 1975. Ten hours of helicopter flying resulted in shooting 23 adult coyotes and taking 51 coyote pups from seven dens. Herd composition work in the control area is as follows:

Year		Fawns/100 does
1966		40
1967		32
1968		25
1969	Rabbit population dropped rather drastically	42
1970		43
1971		28
1972	Use of 1080 curtailed	27
1973		10
1974		8
1975		15

Plans are to repeat the control work this year and in coming years. An attempt will be made to compare kid survival in the predator control area with survival in areas of similar habitat.

B. Antelope Transplanting Program - Update

The last antelope trapped and transplanted in Oregon were captured west of Brothers, Oregon, in late February, 1969. Eleven head released on Virtue Flat, east of Baker, are now estimated to number near 75 head. A similar size release on the Crooked River National Grasslands is estimated to number approximately 40 head. Coyote predation and highway mortality are thought to be two factors limiting the growth of this herd.

A total of 19 antelope was released on the Umatilla Ordnance Depot in February, 1969. Seventeen animals were alive in March. By September, 1970, the herd totaled only 12 adults and one kid. Intensive coyote control was started at that time. History of this program follows:

Year	Coyotes Taken by Government Trapper
1970	38
1971	113
1972	17
1973	36
1974	20
1975	Incomplete

B. Range Modification

Sagebrush conversion projects continue but at a greatly reduced rate from past years.

Miscellaneous

A. Disease, Parasites, Predation

No evidence of mortality from disease or parasites was found. A predator control project was initiated on a large portion of the Wagontire Unit in early May, 1975. Ten hours of helicopter flying resulted in shooting 23 adult coyotes and taking 11 coyote pups from seven dens. Data compositon work in the control area is as follows:

Year	Pups/10% Area
1966	40
1967	33
1968	35
1969	Rabbit population dropped rather drastically 17
1970	43
1971	28
1972	Use of 1080 curtailed 27
1973	30
1974	8
1975	15

Plans are to repeat the control work this year and in coming years. An attempt will be made to compare old survival in the predator control area with survival in areas of similar habitat.

B. Antelope Transplanting Program - Update

The last antelope trapped and transported in Oregon were captured west of Arthurs, Oregon, in late February, 1969. Eleven head released on Virtus Flat, east of Burns, are now estimated to number near 75 head. A similar size release on the Crooked River National Grasslands in sections 10 number approximately 40 head. Coyote predation and highway mortality are thought to be two factors limiting the growth of this herd.

A total of 15 antelope was released on the Umatilla Ordnance Depot in February, 1969. Seventeen animals were alive in March. By September, 1970, the herd totaled only 13 adults and one kid. Intensive coyote control was started at that time. History of this program follows:

Year	Coyotes Taken By Government Trapper
1970	84
1971	113
1972	17
1973	16
1974	20
1975	Incomplete

Additionally, there is an unknown number of predators taken by individuals while on their normal business.

Since predator control work began, the kid crop has been 100 or more kids per 100 does except for 1974 when it was only 31 kids per 100 does. The 1975 ratio was 100 kids/100 does, based on an actual classification of 19 does, 19 kids and 35 bucks. Highway kills have been another source of mortality for this herd. A minimum of five antelope are known to have died by this means in 1975.

Current total population of the Ordnance herd is estimated at 100-125 head.

IV. Summary

A. The population index continued to decline, being five percent below the 1974 index of 2.1 antelope per mile. The 2.0 antelope per mile observed in 1975 was 11 percent above the ten year average of 1.8. There were 7,745 antelope observed on 3,905 miles of 1975 census route.

B. The 1975 herd composition work revealed a slight increase in the buck ratio from 24 per 100 does in 1974 to 25 bucks per 100 does. The kid ratio of 34 per 100 does, was identical to the 1974 ratio. This is eight percent below the 10 year average of 37 kids per 100 does.

C. A 74 percent return of report cards from the 1,520 tag holders revealed an estimated total harvest of 628 animals.

This was a decrease of 84 bucks from the 1974 harvest, and 121 fewer animals than were harvested in 1973. An additional 118 tags were issued for two Gerber Reservoir Archery seasons. No antelope were reported taken by the archers.

V. Recommendations

A. Consider the initiation and evaluation of predator control program(s) on selected antelope ranges. Especially, assess impact of control work on kid survival.

B. Continue pursuit of the cause of developing interest and financial aid to study the problem of low antelope kid survival on our desert ranges. A comparison area such as Bear Valley is available for use in such a program.

Additionally, there is no obvious number of predators taken by individuals which on their normal beginning.

Since predator control work began, the kid crop has been 100 or more kids per 100 does except for 1974 when it was only 11 kids per 100 does. The 1975 ratio was 100 kids/100 does, based on an actual classification of 19 does, 19 kids and 15 bucks. Highway kills have been another source of mortality for this herd. A minimum of two antelope are known to have died by this means in 1975.

Current total population of the ordnance herd is estimated at 100-125 head.

Summary

A. The population trend continued to decline, being five percent below the 1974 index of 2.1 antelope per mile. The 2.0 antelope per mile observed in 1975 was 11 percent above the ten year average of 1.8. There were 7,445 antelope observed on 3,905 miles of 1975 census route.

B. The 1975 herd composition count revealed a slight increase in the buck ratio from 24 per 100 does in 1974 to 25 bucks per 100 does. The kid ratio of 37 per 100 does, was identical to the 1974 ratio. This is eight percent below the 10 year average of 37 kids per 100 does.

C. A 74 percent return of radio equipped from the 1,510 trapped antelope revealed an estimated total harvest of 528 animals.

This was a decrease of 44 bucks from the 1974 harvest, and 121 fewer bucks than were harvested in 1973. An additional 118 tags were issued for the Central Nevada Armory maneuvers. No antelope were reported taken by the armorers.

Recommendations

A. Consider the initiation and continuation of predator control program(s) on selected antelope ranges. Especially assess impact of control work on kid survival.

B. Continue support of the cause of developing interest and financial aid to study the problem of low antelope kid survival on our desert ranges. A comparison area such as Deer Valley is available for use in such a program.

TABLE I

1975 AERIAL ANTELOPE INVENTORY

Unit	District	Miles	Antelope	Antelope per Mile 1975	1974	10-Year Average
Beulah	Malheur	190	333	1.8	2.5	2.5
Ft. Rock-Silver Lake	Lake	225	273	1.2	0.9	0.6
Beatys Butte	Harney	900	2,257	2.5	2.2	2.4
Interstate	Lake	50	103	2.0	2.1	1.2
Juniper	Harney	240	485	2.0	2.0	
	Lake	50	222	4.4	-	
Total		290	707	2.4	-	1.5
Malheur	Harney	140	795	5.7	4.7	2.7
Maury	Deschutes	200	112	0.6	0.7	
	Ochoco	125	420	3.7	5.2	
Total					2.5	1.5
Murderer's Cr.	Harney	40	0	0	2.8	-
Ochoco	Ochoco	125	171	1.4	1.6	1.7
Owyhee	Malheur	175	439	2.5	4.4	2.7
Paulina-Wagontire	Deschutes	450	631	1.4	1.9	
	Harney	60	116	1.9	0.5	
	Lake	25	85	3.4	-	
Total					2.0	1.5
Silvies	Ochoco	125	125	1.0	1.4	
	Harney	60	0	0	1.4	
Total		185	125	0.7	1.4	1.0
Steens Mt.	Harney	220	443	1.6	2.2	1.2
Warner	Lake	105	365	3.5	-	3.7
Whitehorse	Malheur	400	370	0.9	1.3	1.2
TOTALS & AVERAGES		3,905	7,745	2.0	2.1	1.8

TABLE II

History of Antelope Population Trends

Year	Antelope observed	Miles traveled	Antelope per mile
1975	7,745	3,905	2.0
1974	7,930	3,725	2.1
1973	9,270	4,090	2.3
1972	8,627	4,075	2.1
1971	8,055	3,375	2.4
1970	8,244	4,150	2.0
1969	6,326	4,150	1.5
1968	7,298	4,250	1.7
1967	7,593	4,125	1.8
1966	6,010	4,000	1.5
1965	5,859	3,775	1.6
Averages	7,542	3,965	1.9
10 Year averages:			
1965-74	7,521	3,972	1.9

TABLE III

Antelope Herd Composition

Year	Bucks	Does	Kids	Total	Per 100 Does	
					Bucks	Kids
1975	353	1,397	474	2,224	25	34
1974	340	1,394	472	2,060	24	34
1973	464	1,582	413	2,459	29	26
1972	554	2,004	747	3,305	28	37
1971	584	1,692	498	2,774	35	29
1970	483	1,521	715	2,719	32	48
1969	292	1,138	562	1,992	26	49
1968	308	1,265	509	2,068	24	40
1967	285	917	290	1,492	31	32
1966	298	1,029	436	1,763	31	40
1965	269	879	343	1,491	31	39
1964	412	854	432	1,698	48	51
1963	355	887	581	1,823	40	66
1962	321	785	452	1,558	41	57
1961	214	770	347	1,331	28	45
1960	326	942	555	1,823	35	59
1959	393	806	361	1,560	50	45
1958	274	711	551	1,536	39	77
1957	203	608	493	1,304	33	81
1956	236	542	320	1,098	44	59
1955	194	455	268	917	43	59
1954	350	730	477	1,557	48	65
1953	417	950	589	1,956	44	62
1952	419	952	470	1,841	44	49
1951	334	694	417	1,445	48	60

TABLE III-a

1975 ANTELOPE HERD COMPOSITION

Area	Wildlife Management District	Antelope Classified				Bucks Per 100 Does			Fawns Per 100 Does		
		Bucks	Does	Fawns	Total	1975	1974	*Ave.	1975	1974	*Ave.
Beatys Butte	Harney	45	61	27	133	74	12	25	44	20	35
Juniper	Harney	2	34	8	44	6	17	33	24	38	33
Malheur	Harney	27	108	32							
	Malheur	10	83	24							
Total		37	191	56	284	19	46	35	29	39	37
Maury	Ochoco	19	54	3	76	35	40	33	6	11	28
Murderer's Cr.	Grant	46	103	102	251	45	25	49	99	57	74
Ochoco	Ochoco	41	168	50	259	24	42	34	30	64	51
Owyhee	Malheur	4	22	8	34	18	14	21	36	35	25
Paulina-Wagontire	Deschutes	21	127	19							
	Lake	2	17	8							
Total		33	144	27	204	23	22	24	19	12	28
Ft. Rock-Silver Lake	Lake	10	44	22	76	23	19	25	50	77	46

* Seven-year average - 1968-1974

TABLE III-a

1975 ANTELOPE HERD COMPOSITION
(Continued)

Area	Wildlife Management District	Antelope Classified				Bucks Per 100 Does			Fawns Per 100 Does		
		Bucks	Does	Fawns	Total	1975	1974	*Ave.	1975	1974	*Ave.
Silvies	Ochoco	22	59	5	86	37	28	24	8	49	32
Steens Mt.	Harney	32	175	64	271	18	16	33	37	26	37
Warner	Lake	14	128	34	176	11	25	24	27	12	31
Whitehorse	Harney	12	40	6							
	Malheur	36	174	62							
Total		48	214	68	330	22	26	23	32	45	37
TOTALS AND AVERAGES		353	1,397	474	2,224	25	24	**29	34	34	**37

* Seven-year average - 1968-1974
** Ten-year average - 1965-1974

1975 ANTELOPE SEASON
(74% Report Card Return)

Management Units	Tags Issued	Report Cards Received	Number Did Not Hunt	Number Hunted	Reported Harvest	Percent Success	Hunter Days
Beatys Butte	160	122	4	118	74	63	329
Beulah	75	56	2	54	41	76	135
Ft.Rock-Silver Lake	20	13	1	12	6	50	37
Interstate(Lake Co.)	50	35	1	34	22	65	75
Juniper	125	95	7	88	40	45	252
Malheur River	150	108	2	106	64	60	249
Maury	60	43	1	42	18	43	106
Murderer's Creek	15	13	0	13	12	92	19
Ochoco	50	34	2	32	17	53	80
Owyhee	150	106	8	98	37	38	257
Paulina-Wagontire	75	58	1	57	30	53	166
Silvies	75	64	0	64	28	44	147
Steens Mt.	160	122	5	117	48	41	336
Warner	90	73	5	68	21	31	221
Whitehorse	250	168	4	164	57	35	463
Nat'l Antelope Refuge	15	12	0	12	8	67	35
TOTALS	1,520	1,122	43	1,079	523	48	2,907
Gerber Reservoir Archery Seasons:							
1st Period	60	39	2	37	0	0	187
2nd Period	58	24	2	22	0	0	117

Estimated total harvest: 628

1975 ANTELOPE STATUS REPORT

SHELDON-HART MOUNTAIN NATIONAL ANTELOPE REFUGES & CHARLES SHELDON ANTELOPE RANGE

Eldon L. McLaury, Assistant Refuge Manager
U. S. Fish & Wildlife Service

I. HERD SURVEYS

A. Annual Census Activities

1. The mid-winter aerial antelope census was completed 11 and 24 February, 1975. High winds, patchy snow and variable weather conditions made counting difficult and it was impossible to complete the census in consecutive days. Table I presents results of this census since 1969.

TABLE I. Winter Population Trends

Unit	1969	1970	1971	1972	1973	1974	1975
Hart Mtn. Biological Unit*	0	95	85	84	90	199	50
Sheldon Biological Unit*	1340	1705	2025	857	1185	1625	1495
Total Sheldon-Hart Mtn. Biological Units*	1340	1800	2110	941	1275	1824	1545

*Biological Units described in Appendix I.

Because of annual variations between each census, (Table I), it is difficult to draw pertinent management conclusions based on population trends shown by these data. As a result, we are considering the feasibility of deferring this census procedure to every three years rather than annually. Our objective would be monitoring pronghorn use on wintering areas rather than measuring population trends.

2. The summer aerial antelope census was completed 29 and 30 July, 1975. Census methods, dates and procedures were comparable to early census activities. Table II presents census results since 1969.

TABLE II. Summer Population Trends

Unit	1969	1970	1971	1972	1973	1974	1975
Hart Mtn. Biological Unit*	178	508	310	454	646	496	369
Sheldon Biological Unit*	949	1060	874	728	792	867	549
Total Sheldon-Hart Mtn.	1127	1568	1184	1182	1438	1363	918

*Biological Unit areas described in Appendix I.

We classified 918 pronghorns, 445 less than a year ago. However, our sample is considered adequate to present significant herd ratio trend data. Table III presents this data based on herd composition counts from Hart Mountain and Sheldon Biological Units since 1969.

TABLE III. Summer Herd Ratios

	1969	1970	1971	1972	1973	1974	1975
Number Classified	1127	1568	1184	1182	1423	1363	918
Bucks	319	351	299	261	265	328	164
Does	635	799	794	667	925	906	570
Kids	173	418	91	254	233	129	174
Bucks/100 Does	50	44	38	39	29	36	29
Kids/100 Does	27	52	11	38	25	14	31
Kids/100 Adults	18	36	8	27	20	10	24

B. Buck:Doe Ratios

The 1975 buck:doe ratio is seven bucks less than counted in 1974, and the same as counted in 1973 (Table III). It is probable we missed some lone bucks on the census which may account in part for the reduction. Perhaps this potential problem could be corrected by conducting the summer census August 20-25, near the beginning of breeding season when bucks are with the herds.

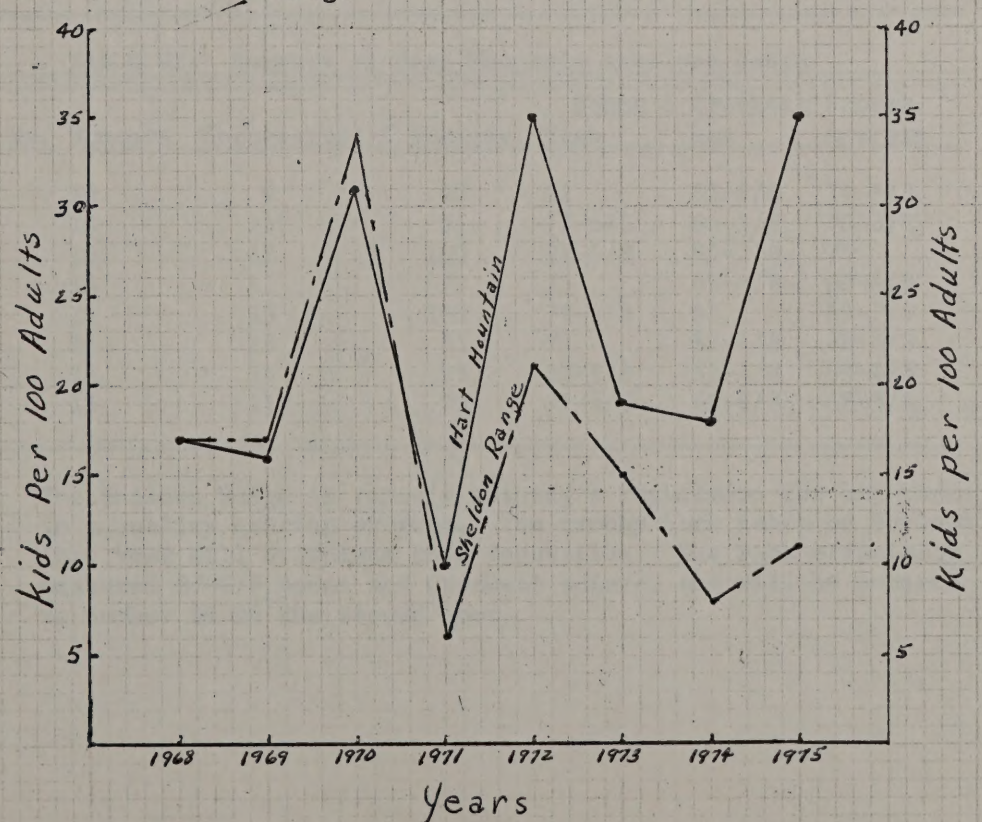
C. Production

Production ratios based on combined counts from both biological units increased from 10 to 24 kids per 100 adults in 1975 (Table III). However, production is still much below the potential for pronghorns; why remains an unanswered question. Since we collect similar data by similar methods from all units within the census area, we frequently compare reproductive success (kids per 100 adults) on the different units. Table IV and Figure 1 present a comparison of these data from Hart Mountain Refuge and the Sheldon Antelope Range.

TABLE IV. A Comparison of Pronghorn Reproduction Ratios on Hart Mountain Refuge and Sheldon Range

Kids per 100 Adults	1968	1969	1970	1971	1972	1973	1974	1975
Hart Mountain	17	16	31	10	35	19	18	35
Sheldon Range	17	17	34	6	21	14	8	11

FIGURE I: A Comparison of Pronghorn Reproduction Ratios on Hart Mountain Refuge and Sheldon Range



An examination of Table IV and Figure I indicates there may be a trend developing which shows pronghorns on Hart are better producers than pronghorns on Sheldon. The reasons for this difference are numerous, but habitat may be a principal factor. The impact of wild horses on the Sheldon Range may be the problem.

D. Harvest

Trophy buck hunting programs continued on Sheldon and Hart Mountain in 1975. Tables V and VI summarize results from each area.

TABLE V. Summary of Sheldon Antelope Hunts

Year	No. Hunters	Successful	% Success	Boone & Crockett Scores High	Low	Average
1967	10	10	100	75-5/8	45-1/8	69-2/8
1968	10	10	100	81-2/8	64-2/8	73-6/8
1969	20	20	100	78-4/8	64-3/8	70-3/8
1970	20	17	85	86-2/8	57-4/8	72-5/8
1971	19	18	95	81-4/8	46-6/8	73-5/8
1972	20	17	85	80-4/8	63-1/8	71-4/8
1973	20	20	100	84-	59-2/8	72-6/8
1974	20	19	95	85-2/8	63-4/8	70-6/8
1975	20	19	95	87-4/8	64-	74-6/8

TABLE VI. Summary of Hart Mountain Antelope Hunts

Year	No. Hunters	Successful	% Success	Boone & Crockett Scores High	Low	Average
1968	10	9	90	82	65-6/8	74-5/8
1969	16	15	94	77-6/8	64-2/8	70-3/8
1970	15	15	100	81-6/8	65-2/8	73
1971	14	11	79	75	65-4/8	69-4/8
1972	15	15	100	78-4/8	53	69-7/8
1973	16	13	81	79	57-4/8	68-4/8
1974	15	14	93	81-5/8	53-4/8	69-2/8
1975	15	11	73	77-4/8	46-6/8	68-5/8

The Sheldon Range is rapidly gaining a reputation for big bucks in a quality hunting program. The trophy buck taken on Sheldon this year will stimulate this reputation. The buck officially measured 87-4/8 Boone and Crockett points, and will be entered as number 16 in the record book.

Competition for tags is keen on Sheldon and Hart Mountain as the word spreads on quality and success of the hunting programs. On the Sheldon Range 159 hunters have taken 150 pronghorns since 1967, for an average success rate of 94%. On Hart Mountain, 116 hunters have taken 103 pronghorns since 1968, for an average success rate of 89%.

II. RANGE SURVEYS

A. Weather Conditions

Pleasant but dry conditions at the close of 1974 changed abruptly in early January when S.E. Oregon and N.W. Nevada were blanketed with numerous snowstorms and above average precipitation. The last big storm of the winter moved through the area June 18-24, dumping up to 3.0 inches of moisture in up to 6.0 inches of snow. Water runoff from snowpacks up to 200% above normal recharged lakes, ponds and reservoirs to overflowing. July thunderstorms provided additional soil moisture to supplement growing conditions during the pleasant but dry fall and winter. At the close of the year we were once again faced with low soil moisture content and below average snowpacks.

B. Range Modifications

No new programs were initiated, and personnel limitations made it difficult to keep up with general maintenance of existing facilities. There were no range fires or other range modifications known to occur except for exponential growth rates in wild horse and burro populations present in all biological units. The impact year around grazing by horses and burros has in range modifications is unknown.

C. Range Evaluations

Excellent spring and early summer moisture conditions encouraged grass, shrub and forb growth and regrowth into late summer. Water supplies were well dispersed over the range with pronghorn use distributed throughout areas of preferred habitat. Range plant growth was the best recorded for a number of years. Fall green up from existing soil moisture along with an open winter encouraged pronghorns to remain on their traditional late summer/early fall range at the close of the year.

III. MISCELLANEOUS EVALUATIONS

A. Disease

None known to have occurred.

B. Predation

None observed or found.

C. Tagging

None.

D. Research

Mr. James Good completed his second and final summer's research for his project "Correlation of Habitat Factors with Pronghorn Use on Small Playas in South Central Oregon". In his research on Hart Mountain, Mr. Good found that "drinking water is important for pronghorn use of playas, but varies in importance when related to other habitat factors. Also, that canopy coverage of vegetation does not appear as important for pronghorn use of the playas as were certain species, particularly leafy arnica (Arnica foliosa) ..... as the season progressed. Diversity and succulence of vegetation particularly forbs were important for pronghorn use of the playas." A copy of Mr. Good's completed thesis will be on file at the Sheldon-Hart Mountain-Modoc Refuges office, P. O. Box 111, Lakeview, Oregon 97630.

IV. SUMMARY

A. Population trend data based on mid-winter counts is unreliable to form management conclusions for the Sheldon-Hart Mountain refuges. It is suggested to drop this census procedure from an annual program to once every three years.

B. Buck:doe ratios derived from the summer census are down from last year, and 10 below the six year average for this census.

C. Production based on combined data from the Sheldon and Hart biological units is up 14 kids per 100 adults from last year, and compares to the production average recorded in 1972. However, when defined by units, production on Hart Mountain was 35 kids per 100 adults compared to 11 kids per 100 adults on the Sheldon Range; a difference of 24 kids per 100 adults or production on Hart Mountain was 3.2 times better than on Sheldon. Range condition and trend may be part of the problem.

D. Sheldon hunters had better success than Hart Mountain hunters, although both groups enjoyed a high success rate. A buck officially measuring 87-4/8 B&C points was taken at Sheldon and will be recorded as #16 or #17 in the record book.

E. Excellent soil moisture conditions following a cold, wet spring enhanced summer and fall vegetative growth. Most waterholes carried water into the winter, and pronghorns remained on traditional late summer-fall ranges at the end of the year.

V. RECOMMENDATIONS

A. Hunting - No change.

B. Census - Complete mid-winter census every three years rather than annually.

C. Predator Control - No change.

D. Research - Thesis in preparation for 1974-75 study on Hart Mountain.

APPENDIX I

Biological Unit Descriptions

Hart Mountain Biological Unit is comprised of four subunits:

1. Hart Mountain National Antelope Refuge.

2. South of Hart Mountain - The area south of the refuge boundary to Highway 140, west to Warner Valley, and east to Guano Valley.

3. Guano Valley - The area from Highway 140 north to Shirk Lake and the Spalding Ranch, east to Doherty Slide and west to the rims above the valley.

4. Sagehen Hills - The area north and east of the Nevada state line to a general line from the peak east of the Spalding Ranch across Ackley and Hawk Mountain to the Nevada state line at the east end of Big Springs Table, and west to Doherty Slide.

Sheldon Biological Unit is also comprised of four subunits:

1. Charles Sheldon Antelope Range.

2. Sheldon National Antelope Refuge.

3. Macy Flat - The area south of the refuge boundary, east to the Range boundary, north to the Oregon state line, and west to the road from Coleman Canyon to the Oregon state line.

4. Massacre Lakes - The area south and east of the Range boundary to Painted Point and north of Highway 8A including the lake basins and associated uplands.

Prepared by:

Jerry L. Page - Wildlife Biologist
With assistance of Ernie Schofield and Steve Meyer, Fire Station Managers.

SURPRISE RESOURCE AREA

"PRESCRIBED BURNING PLAN"

for

Wildlife Habitat Improvement

February 9, 1976

Approved by:

Harold Brandsted — Area Manager — Feb 13, 76 — Date

Hal A Fuchs — Fire Management Officer — Feb 20, 76 — Date

C. Roy Cleary — District Manager — 2/24/76 — Date

PREFACE

The complete exclusion of fire has caused a build up of decedent vegetation and an accumulation of dangerous fuel which may result in catastrophic fire. This combination has caused a sagebrush monotype which is not favorable to most wildlife species. In fact it has reduced wildlife - carrying capacity for our most important game species (deer, sage grouse, and antelope).

This plan provides guidelines and constraints to use a technique developed by the Humboldt National Forest in Northern Nevada called "spring burning", to restore wildlife habitat.

INTRODUCTION

RELATIONSHIP: VEGETATION - WILDLIFE - LIVESTOCK - FIRE

Many years of continuous grazing and at times overgrazing by domestic sheep, cattle, feral horses and deer and the introduction of exotic plants have brought about massive changes in the natural vegetation. Most of the perennial grasses, e.g. bluebunch, wheatgrass and Idaho fescue were never subjected to concentrations of large ungulates prior to the introduction of livestock (Franklin & Dyrness 1973). Consequently, these bunch grasses were not adopted to such grazing pressure and decreased. This enabled the more unpalatable shrubs (sagebrush, rabbitbrush and juniper) to increase. It has been well established that quality and availability of forage dimishes as big sagebrush invades.

The 30 year study of Harniss and Murray (1973) and a study by Blaisdell (1953) showed how big sagebrush has an overwhelmingly dominant role. Almost all important species of shrubs, grasses and forbs decrease in yield as big sagebrush recovered its dominance after a burn. "Heavy grazing" will accelerate such reinvasion (Pechanec et al. 1954) as well as a loss of desirable understory forage. Sagebrush will not only reinvade, but will also move in much thicker, taking the place of the desirable forage which was removed by livestock. However, with proper livestock management established with a spring burning program, a sagebrush biome can be converted back toward a desirable diversity of vegetation.

The problem associated with sage grouse, antelope, bighorn sheep and a variety of nongame wildlife is the lack of habitat diversity and productivity which was present when the range was in a climatic condition. The Mule Deer, being a subclimax species, exhibits complicated and complex problems associated with nutritious food, cover, predation cycles and etc.

In a very general way, each species of wildlife is adapted to an area which enables the species to carry on life functions. The key to providing habitat to nearly all species of wildlife is to provide a diversity in habitat types. This monotype of big sage should be broken up to provide optimal environment for wildlife species. This method of improper habitat structure or interspersion can reduce the carrying capacity or increase wildlife vulnerability. The proper maintenance of ecosystem diversity is the most important aspect of management today because of the increased awareness of non-consumptive wildlife. Although not normally considered a use, wildlife can serve as a "barometer" of the condition of the ecosystem.

The use of fire to remove brush has been condemned because of the harmful consequences of wildfire. But much of the disastrous affects of fire in a big sagegrass biome can be contributed to the lack of livestock management for the area after the burn. Grazing before the resprouting plants have a vigorous supply of carbohydrates and new seedlings are established are the culprits of most sagebrush ranges damaged by fire.

This new technique of "spring burning" coupled with "rest rotation grazing" fire seemingly can be an ideal tool to achieve many wildlife objectives in solving the paradox of "sagebrush monotypes."

Wildlife Objectives:

Clearly fire, vegetation and animals are bound together. As the environment is changed wildlife responds. Biswell el al. (1952) found spot burns of 5 - 10 acres in a checkerboard pattern produced more deer, heavier deer, more fawns, more jackrabbits (Lepus sp.), brush rabbits (Sylvilagus), mourning doves (Zenaidura), and valley quail (Zuphortyx) than unburned areas.

This heterogeneity effect of spot burning allow different animals to reside in different seral stages. On a burn at Vancouver Island in a herb-shrub seral stage, white-crowned sparrows (Zonotrichia), towhees (Pipilo), and robins (Turdus) resided. Then across the edge into another older burn in a young tree seral stage, western tanagers (Pir anga), warbling vireos (Vireo), and varied thrush (Ixoreus) are found (Daubenmore 1968; Heinselman 1970; Vogl 1970). Schlatterer (1960) and Dalke et al. (1963) mentioned how areas unintentionally burned created sage grouse strutting grounds that birds were quick to occupy. It also has been found that mammals and birds which move into a burn contain less external and internal parasites, than animals living off a burn site (Brynard 1971).

Klebenow (1972) explained the beneficial affects of prescribed burning on sage grouse. Other galliforms such as sharp-tailed, prairie chicken, quail, wild turkey, and blue grouse are also benefited (Zwickel and Bendell 1972, Amman 1963, Vogl 1967). Thompson and Smith (1970) concluded that control of fire and subsequent loss of open prairie contributed to extinction of the heath hen (Tympan uchus sp.). Many

wildlife biologist predict this same destiny to the sage grouse.

Sigurd Olson (1969) outlines the ecological role fire plays in the environment:

> "While man with his great machines and inventive genius for altering his living space is a major ecological force today, the elemental force of fire still, as always, molds the Earth and all its life--but only where the ancient cycles have not been interfered with. As a preparer of soil and healthful growth conditions for all animals and plants, fire has determined the vegetational patterns that exist in many parts of the world. It is an intergral part of the ancient ecology with its checks and balances, a fragile and easily upset stability. Only when fire is recognized as an ecological force with delicate interwoven relationships binding all living things to each other and to the Earth, will we begin to understand its role."

It has been well documented that burning is beneficial to most wildlife species. This plan will be keyed to the major game species with emphasis toward keeping the burns small to allow maximum benefit to nongame species.

Antelope

Pronghorn prefer open habitat where they can depend upon their keen eyesight to spot danger and run with few obstacles in their paths. Generally, antelope use the low sage ridge tops, and areas where the big sagebrush has not become too dense (see URA). However, heavy concentrations of sagebrush in the draws and some bottom areas are restricting antelope movement. To be more precise, terrain which provides wide vistas and vegetation which does not average over 18" in height provides the proper community structure. The highest densities of pronghorn are associated with habitat averaging 50% exposed and 50% vegetation. Optimum antelope habitat is when vegetation averages 40-60% grass, 10-30% forbs and 5-10% browse (Yoakum 1974). Thus, it can be seen that in spite of their reliance on forbs and browse as food sources, open grassland characterizes optimum habitat, illustrating that forbs is only one factor of many which ultimately affects pronghorn as well as other wildlife species.

If there is one primary limiting factor, it would be the aspect on winter range and big sage valleys. The overall aspect of this big sage biome is at undesirable brush densities. The reduction in grass and forbs and the increase in sagebrush has caused the overall aspect of the range to be unfavorable to antelope. From an antelop's standpoint, sagebrush with grass and forbs between the brush would be much more desirable.

1. An objective for antelope would be to convert heavy concentrations of sagebrush to forbs and grass. By leaving numerous fingers or islands of unburned areas, the edge effect created by this technique would be

Antelope

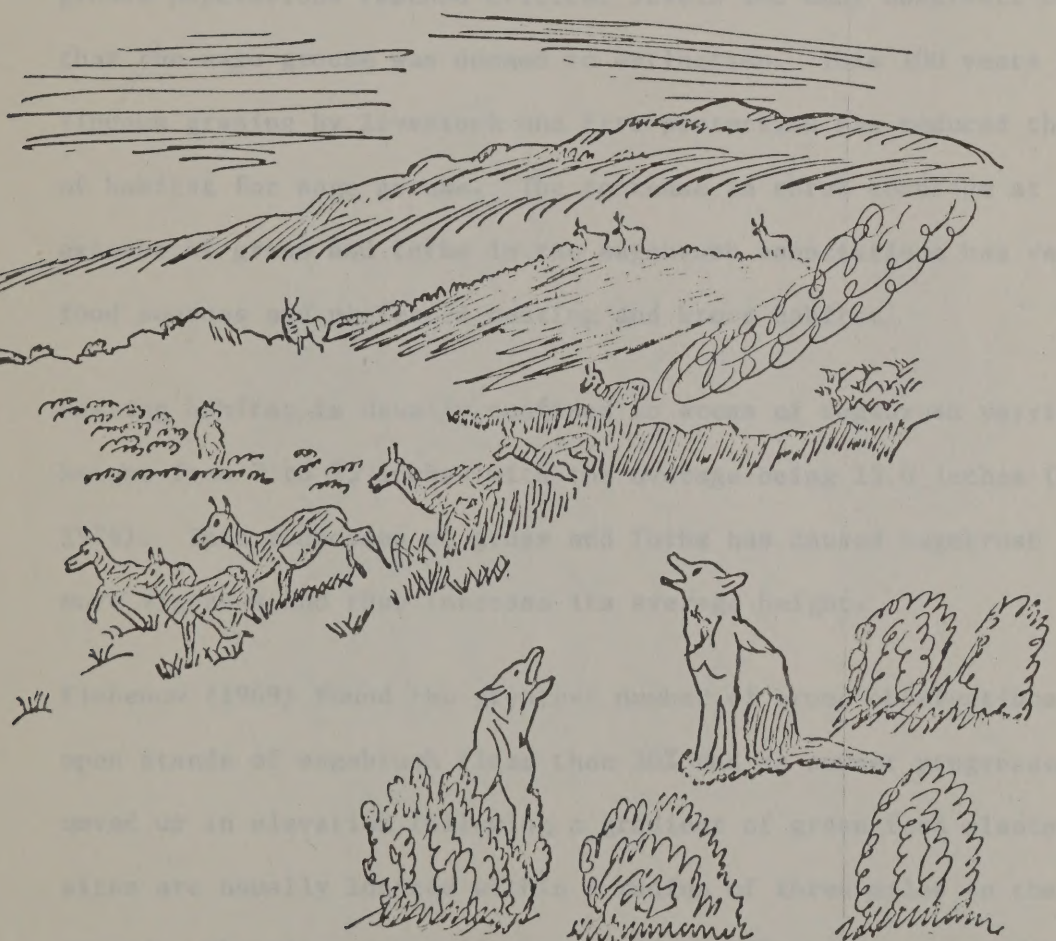
Pronghorn prefer open habitat where they can depend upon their keen eyesight to spot danger and run with the antelope to their peak. Generally, antelope use the low sage type, and areas where the big sagebrush has not become too dense (see USAI). However, heavy concentrations of sagebrush in the draws and along fence lines restricting antelope movement. To be more precise, optimal habitat consists of a mixture of vegetation which does not exceed over 50% in height covering the grass community structure. The highest densities of antelope are associated with habitat averaging 20% sagebrush and 30% vegetation. Optimum antelope habitat is when vegetation averages between 10-20% forbs and 5-10% browse (Yoakum 1978). Thus, it can be seen that in spite of their reliance on forbs and browse as food sources, good grazing characterizes optimum habitat. Illustrating that forbs is not the factor of most significance, ultimately effects pronghorn as well as other wildlife species.

If there is one primary limiting factor, it would be the amount of available range and its ease relative. The overall impact of fire has been shown to at moderately high intensities. The reduction in grass and forbs and the increase in sagebrush (as stated the overall impact of the burn to be unfavorable to antelope. From an antelope's standpoint, vegetation with grass and forbs dominant the burns would be much more desirable.

If an objective for antelope could be to preserve their concentrations of sagebrush in tracts and strips. By leaving numerous fingers or islands of unburned areas, the edge effect created by this technique would be

beneficial to other wildlife species. Substantially reducing (not eliminate) the heavy concentration of sagebrush in the draws will provide areas where antelope will be able to cross and use the big sage valleys and draws.

2. Objective number two would be to burn islands in areas where juniper are encroaching on low sage antelope range.



Hey, Wylie;"It is almost impossible to catch those antelope with that brush gone in the draws."

Sage Grouse

The Sage Grouse (Centrocerus urophasianus), is unique among upland game birds because of its close ecological association with sagebrush (Artemesia sp.). Sage grouse not only uses the sagebrush leaves for food but also for nesting, loafing and escape cover.

Sage grouse were quite abundant during the 18th century. Toward the end of the century, human encroachment on its range brought serious declines especially to populations in fringe areas. By the early 1920's, sage grouse populations reached critical levels and many observers believed that the sage grouse was doomed to extinction. This 100 years of continuous grazing by livestock and fire protection has reduced the quality of habitat for sage grouse. The increase in shrub coverage at the expense of grass and forbs in the sagebrush associations has reduced food sources and preferred nesting and brood habitat.

Nesting habitat is usually confined to areas of sagebrush varying in height from 7 to 25 inches with the average being 15.6 inches (Waltestad, 1974). This reduction of grass and forbs has caused sagebrush to become more vigorous and thus increase its average height.

Klebenow (1969) found the greatest number of brood observations were in open stands of sagebrush (less than 30% and as summer progressed, broods moved up in elevation following a gradient of green food plants. Nesting sites are usually located within a radius of three miles to the strutting ground. The sites generally have a 20 to 30% canopy cover with sagebrush

height varying between 9 to 31 inches. The present sagebrush cover has increased to 35 to 80% shrubs. This density is untolerable to sage grouse and contributes to stress of the species.

The reduction of succulence (especially forbs) on the range is equally a limiting factor for both antelope and sage grouse. Both species prefer 80 to 100% forbs in the early spring and summer.

3. The third objective is to provide a diversity in habitat types and provide new succulent forage, especially forbs.

This change from a diversity of forbs, grass and sagebrush to a sagebrush monotype has caused sage grouse to live under environmental stress.

Deer

This early fast conversion from a grass-shrub type to a shrub type was favorable to the deer herd. The mountain brush-zone was especially favorable to deer from this conversion. Bitter brush and Mountain Mahogany responded with the sagebrush. Presently, these shrubs are old and decadent. This shrub condition has been reducing the deer herd for ten years and it will contribute to further declines in the deer population.

4. Objective number four is to burn spots in the mountain brush zone to provide a release of new forage.

Burning Technique and Constraints

Burning will be attempted in small patches of 1 to 40 acres to increase "diversity", and "edge effect". Long narrow burns will be more desirable than large round burned areas. Creating habitat diversity by developing openings with new succulent food varieties for the wildlife occupants of each sagebrush-grass ecosystem is the major objective. The monotonous sagebrush covered hills and valleys need to be broken up into a forb-grass-shrub diveristy. The different stages of successional growth of a community should be considered to acquire a burning program which fits into the rest period in a grazing rest-rotation system.

An example of a proper grazing procedure to follow (Beardahl & Sylvester 1974) is to:

1. Rest the area from grazing a year before the burn to accumulate litter and develop vigor in the plants.
2. Burn in the spring before the perennial grass has started to grow.
3. Rest the area from grazing the year its burned and until seed ripe time the following year.
4. Place the area into a ecological designed rest-rotation system. Therefore, one pasture could be burned yearly in a specially designed four pasture rest-rotation system and still have the required rest for the burns.

Since recent court rulings require that an Environmental Impact Statement be prepared prior to the implementation of any new grazing systems, initial burning projects will be limited to the following situations:

1. Areas which receive little or no livestock usage.

2. Areas which receive only "Fall and Winter" livestock usage.

3. Areas which are currently under an adequate rest-rotation grazing system. (Experiments will be applied to determine what constitutes adequate degree and timing of rest in specific areas in the Susanville District.)

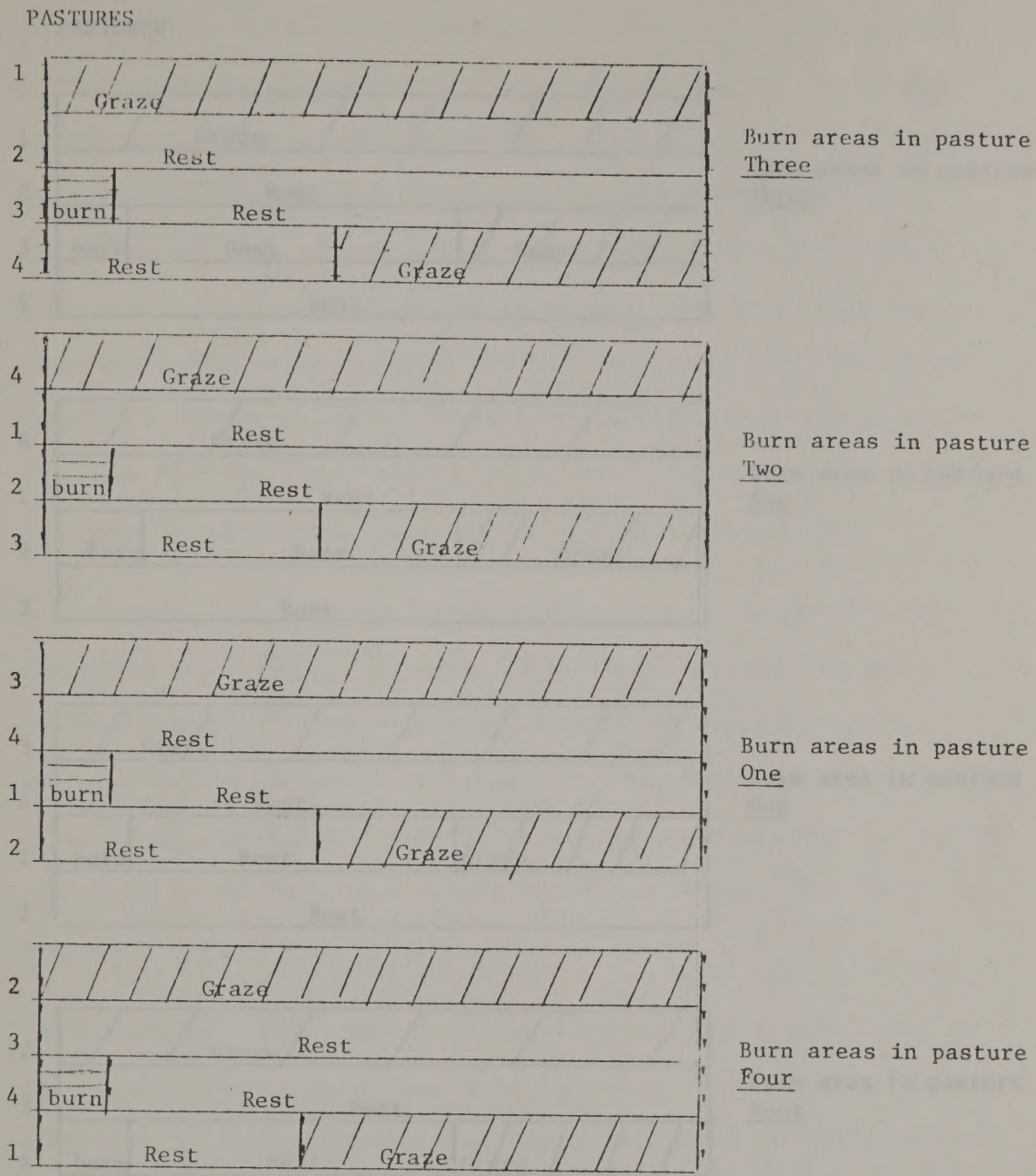
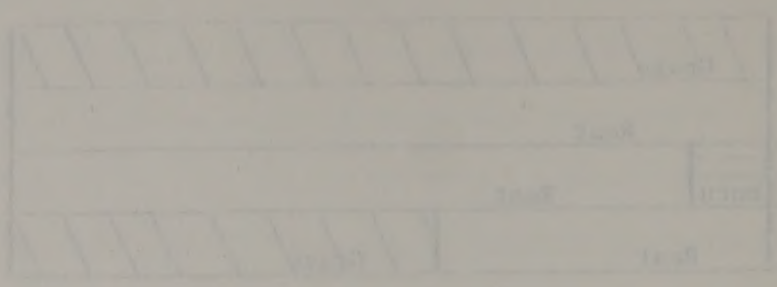
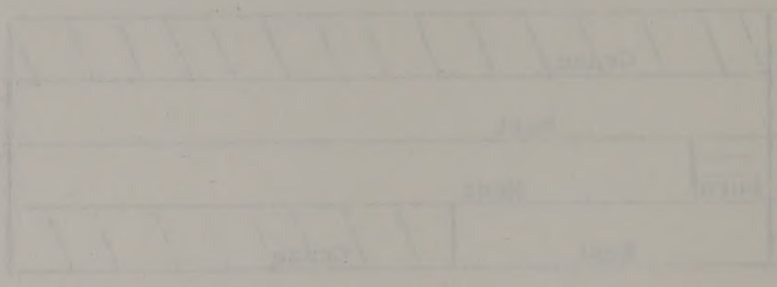
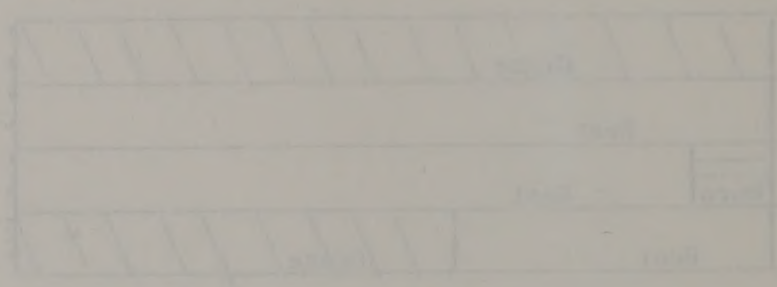
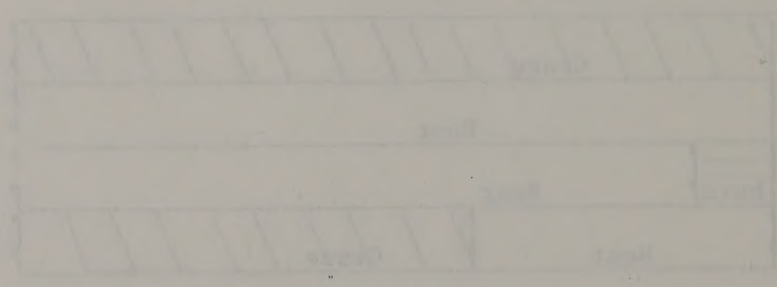


Figure 1. An example of a system which provides adequate grazing rest after a burn.









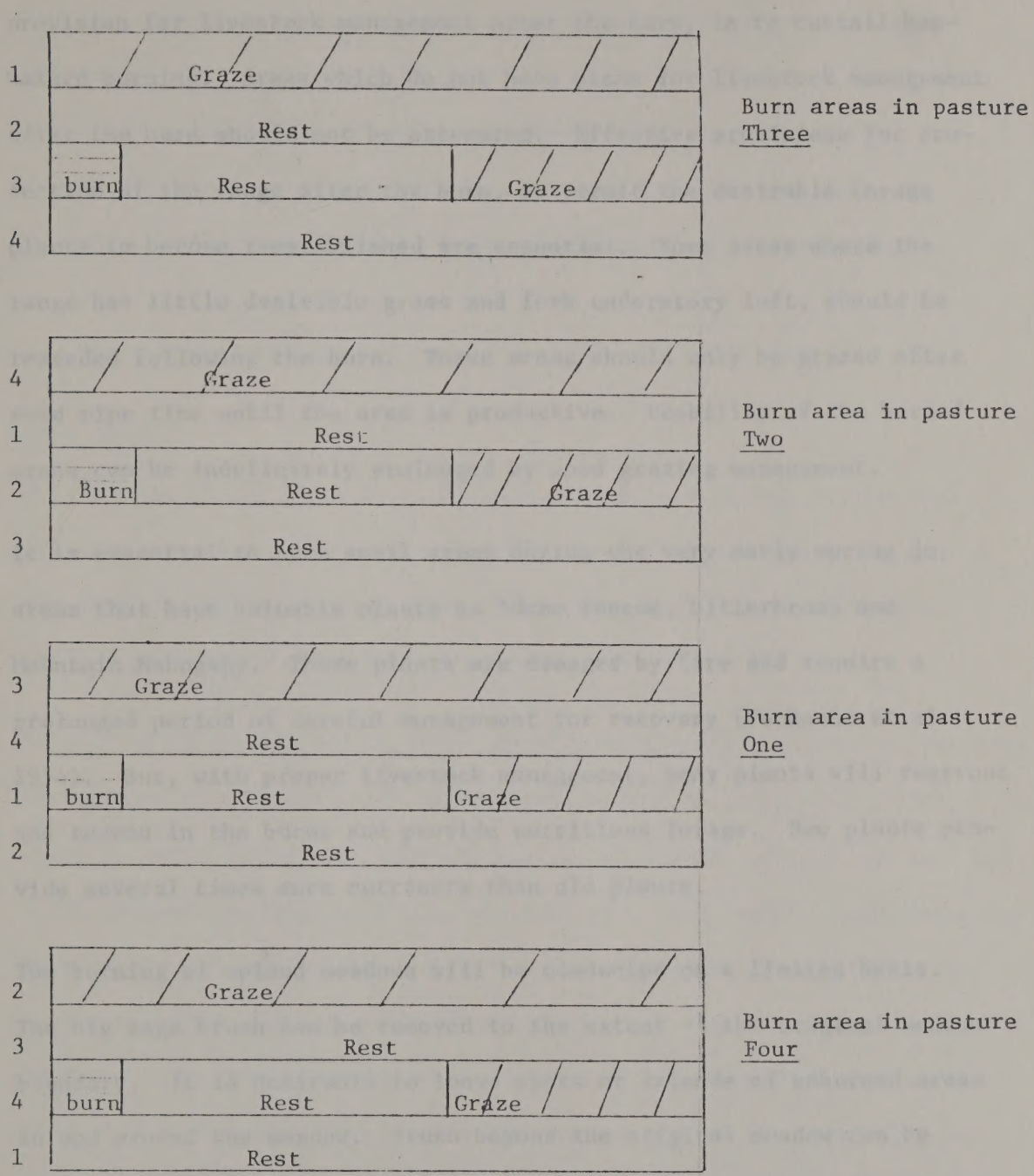


Figure 2. This popular 4-pasture system could give adequate rest after a burn if livestock are kept off the burn until late fall. A range rider should be used to keep grazing animals from concentrating on the burn. Concentrations of livestock will damage browse and grass seedlings.

The chief value for pointing out a proper system, which gives adequate provision for livestock management after the burn, is to curtail haphazard burning. Areas which do not have plans for livestock management after the burn should not be attempted. Effective provisions for protection of the range after the burn, to permit the desirable forage plants to become reestablished are essential. Some areas where the range has little desirable grass and forb understory left, should be reseeded following the burn. These areas should only be grazed after seed ripe time until the area is productive. Usability of the burned areas can be indefinitely prolonged by good grazing management.

It is essential to burn small areas during the very early spring in areas that have valuable plants as Idaho fescue, bitterbrush and Mountain Mahogany. These plants are damaged by fire and require a prolonged period of careful management for recovery (Pechanac et al. 1954). But, with proper livestock management, many plants will resprout and reseed in the burns and provide nutritious forage. New plants provide several times more nutrients than old plants.

The burning of upland meadows will be conducted on a limited basis. The big sage brush can be removed to the extent of the original meadow boundary. It is desirable to leave spots or islands of unburned areas in and around the meadow. Brush beyond the original meadow can be burned in irregular patterns. The rank grass growth in the fenced meadows is our primary initial target in burning meadows.

Where to Burn

Burning sagebrush range only where all of the following conditions prevail:

1. It is outlined in the MFP as a brush control area.
2. Where fires can be and will be controlled.
3. Where soils are fairly firm or where fires can be kept very small (1 to 3 acres) in loose soils.
4. Where livestock grazing can be managed after the fire.

When to Burn

This timing of the burn is a critical factor to minimize deleterious effects. Burning under conditions of extreme dryness, when the plants are growing, produces a hot fast fire. This type of a fire produces serious effects on perennial grass and forbs.

Burning early in the spring under moist conditions, the opposite prevails (Wright 19740). This is the reason burning will be attempted shortly after snowmelt before the current-year grass growth is over one inch tall. A 100 percent sagebrush kill is not desired. Cool, moist conditions leave fingers and islands within the burn. This suggests burning while the plants are physiologically "dry" but the soil is moist. Winds from 10 to 30 M.P.H. will be needed to keep a fire moving during this time of the year. In most areas, the proper time of the year will be February or March.

This timing is the most critical operation with spring burning. Burn during the period when the fire would put the least amount of stress on

the plants and with regrowth taking place in the following few weeks. This period of time before the plants have broken dormancy is also the period before the root reserves are used for spring green up. Wright (1974) also suggested prescribed burning should be conducted when the preferred plants are dormant.

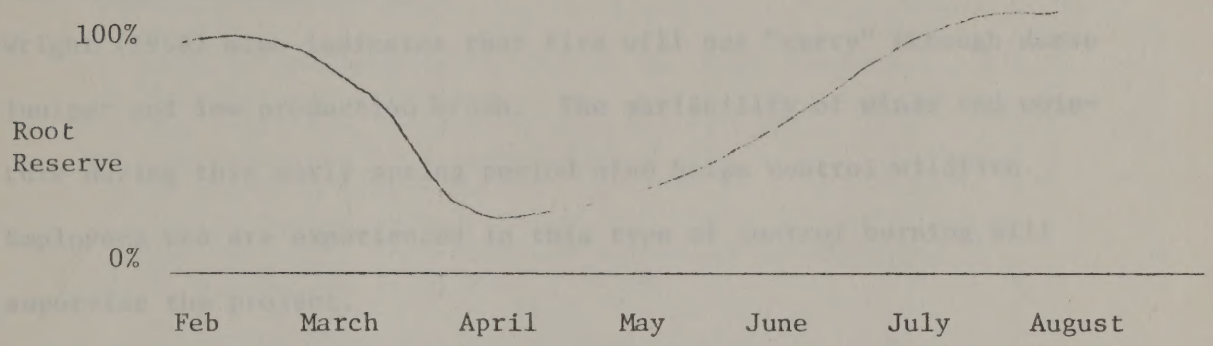
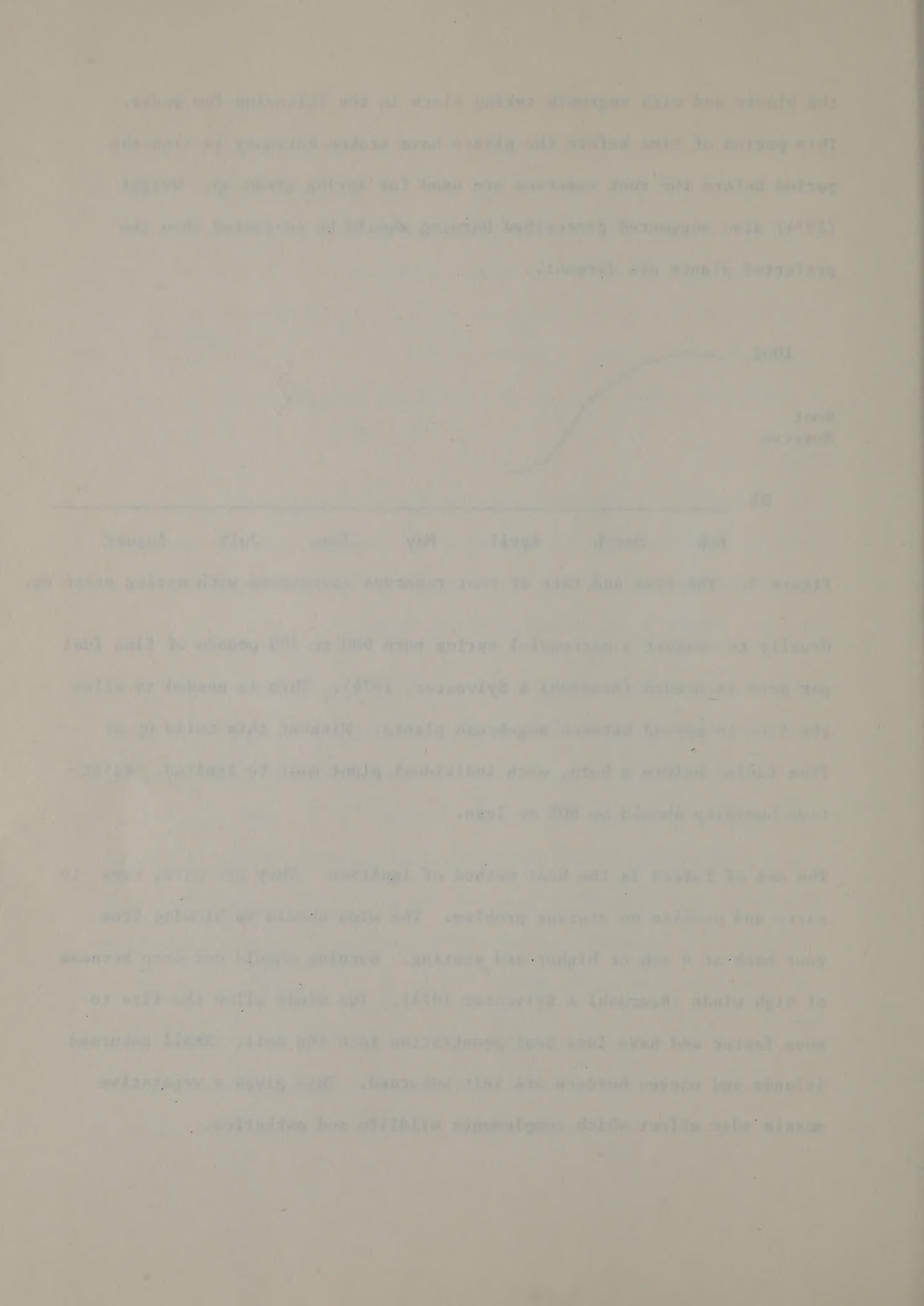


Figure 3. The time and rate of root reserves correspond with spring green up.

Usually to conduct a successful spring burn 600 to 700 pounds of fine fuel per acre is needed (Beardahl & Sylvester, 1974). This is needed to allow the fire to spread between sagebrush plants. Without this build up of fine fuels before a burn, each individual plant must be ignited. Relative humidity should be 60% or less.

The use of fusees is the best method of ignition They are safe, easy to carry and provide no storage problem. The wind should be blowing from your back at 8 mph or higher and gusting. Burning should not stop because of high winds (Beardahl & Sylvester 1974). The winds allow the fire to move faster and have less heat penetration into the soil. Small unburned islands and uneven borders are left unburned. This gives a vegetative mosaic edge effect which complements wildlife and esthetics.



Fire Control Precautions

The exact need of fire control will be evaluated at each site. Usually the U.S. Forest Service has found low-sage areas, snowbanks and rock cliffs provide natural firelines. The Forest Service determined that even during a hot day with winds up to 25 mph, the low sagebrush (Artemesia arbuscula) will not carry a fire (Beardahl & Sylvester 1974). Wright (1968) also indicates that fire will not "carry" through dense juniper and low production brush. The variability of winds and moisture during this early spring period also helps control wildfire. Employees who are experienced in this type of control burning will supervise the project.

If it is determined that a holding force is needed, tankers and fire crews are available. Firelines can be made by back burning or fire retardent. Wildlife prescribed burning report Form #1 must be filled out before each burn project. The outlined course of action will be stringently followed.

Determining Vegetation Trend

The results of this technique will be analysed by taking numerous photos at specific sites at intervals. Iron fenceposts will be used to help identify specific photo sites.

A periodic step toe transit will be taken on some burns to determine vegetation, species composition and change.

WILDLIFE

Prescribed Burning Report

PREPARE FOR ALL BURNING PROJECTS

Instructions: Prepare the following form in advance of all burning.

I. EVALUATION OF THE AREA:

	YES	NO
1. Area is outlined in the M.F.P. as brush control.	( )	( )
2. Can fire be controlled?	( )	( )
3. Are soils firm or can fire be kept small?	( )	( )
4. Can livestock be managed after fire?	( )	( )
5. Is green up less than 3"?	( )	( )
6. Is the ground moist?	( )	( )
7. The burn will meet at least one wildlife objective.	( )	( )
8. Is wind speed in excess of 8 MPH?	( )	( )

* A NO mark will automatically terminate project.

II. WEATHER INFORMATION

1. Air Temperature _____
2. Wind Speed _____
3. Wind Direction _____
4. Humidity _____

III. FIRE CONTROL PRECAUTIONS

1. Fire lines needed _____
   Back burning _____
   Fire retardent _____
   Tankers _____
   Fire Crews _____
   Other _____
2. Use of Natural Barriers _____

IV. ACRES TO BE BURNED _____

Date _____

Signature _____

Form #1

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